

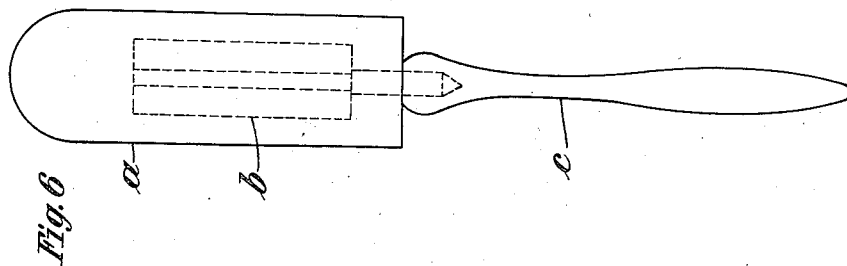
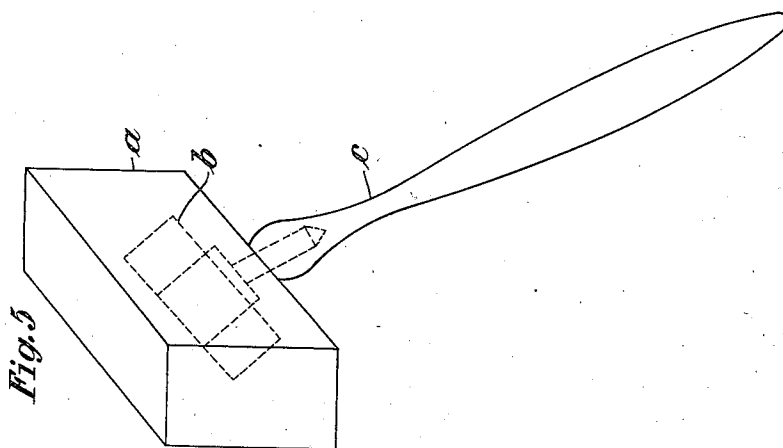
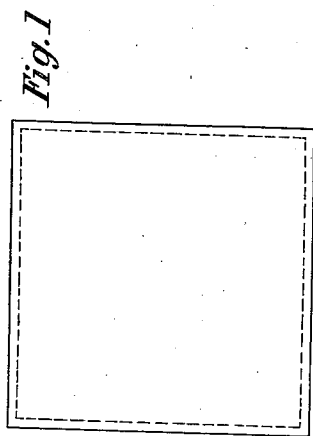
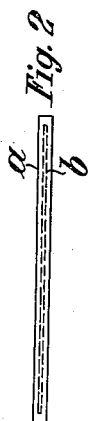
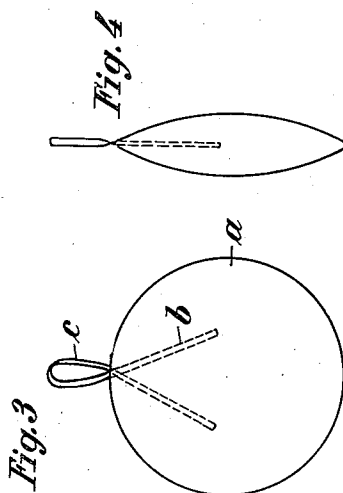
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P. SAFFERT

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MANUFACTURE OF SPONGE ARTICLES

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MANUFACTURE OF SPONGE ARTICLES

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4 Claims. (Cl. 91—68)

My invention relates to the manufacture of sponge articles and more particularly of sponge articles of which the sponge consists of cellulose hydrate as obtained by the coagulation of viscose solutions. It is a continuation in part of my application Ser. No. 715,961 filed March 16, 1934.

One of its objects is a process of manufacturing sponge articles consisting of a preformed cellulosic carrier, such as for instance a cloth, web, a coarse sheet of fabric or a wooden handle, and strongly adhering thereto a sponge mass consisting of cellulose hydrate. Another object are the sponge articles obtained by the aforesaid process. Further objects will be seen from the detailed specification following hereafter.

Viscose sponges are made by coagulating a mass consisting substantially of viscose, a meltable or soluble pore forming substance, such as for instance an unorganic crystalline salt, like sodium sulfate, magnesium sulfate, or salts of volatile bases like ammonium sulfate, and, if required, fibrous materials. More particularly the sponges may be produced according to any of the following U. S. Patents: 1,142,619, 1,611,056, and 1,909,629.

According to this invention there is used a fresh, that is to say a non-coagulated sponge forming mass of viscose for making articles, having the viscose sponge firmly united with structures of various kinds. For instance, tissues made of hemp or cotton or nets from these materials are covered or coated on one or both sides with a non-coagulated sponge forming mass of viscose which is then coagulated, or wooden articles are unwrapped in or lined with a sponge forming dope of viscose and the viscose is then coagulated, by placing it into a boiling salt solution, treating with steam or any other process known to those skilled in the art. In order to produce a firm adherence of the sponges to the carriers it is important that the carriers are made from cellulose or from a material containing cellulose. Before applying the sponge mass which is destined to produce the sponge coating, the cellulosic carrier should be moistened with water, an alkaline liquid or viscose solution. Moistening with an alkaline liquid or an alkaline substance produces a superficial mercerization or a swelling of the cellulose containing carrier and results in a more intimate interconnection.

By the method according to the invention there may produced sponge cloth for use in filter presses as polishing cloths, window rubbers, insoles or the like, having a particularly high suc-

tion power. Or, when used for cleaning plates, glass bottles, window panes or polishing surfaces, the sponges may be provided with wood handles or fixed on handy carriers. The process may also be used for providing sponges with eyes or braids of laces or other materials as a means for suspending them. The process allows of producing sponge cloths having a very high degree of solidity (for filter presses) by applying the sponge forming mass on nets or coarse-meshed fabrics. Such sponge cloths may be employed for filtering purposes. Furthermore the process may serve for producing a floor covering of a good suction power by coating webs or networks with the sponge forming mass and coagulating it subsequently. The sponge forming mass may be applied on one or on both sides.

Fig. 1 of the accompanying drawing shows a front view of a polish cloth and Figure 2 shows a section of a polish cloth consisting of the sponge mass *a* and having an insertion *b* of cloth.

Fig. 3 shows a front view and figure 4 a side view of a round sponge having two convex sides. In the sponge mass *a* there has been inserted a braid with its ends *b* and forming outside the sponge a loop *c* for suspending the sponge. Figures 5 and 6 show differently shaped sponges which may be used for cleaning panes or vessels. These sponges have an insertion *b* of wood having a protruding shaft to which a handle *c* may be fastened by screwing them together or in another suitable manner.

My invention is illustrated by the following examples:

Example 1.—A piece of cloth is subjected to a process of swelling by inserting it into an alkaline viscose solution. A sponge forming mass is produced by mixing 160 grams of a 20 per cent viscose solution with 16 grams of cotton and 1.2 kilos of sodium sulfate, the mixture being then applied to first one and then the other side of the cloth. The cloth is then treated with steam at a pressure of $\frac{1}{2}$ to 10 atmospheres for from 15 minutes to 4 hours. The resulting sponge cloth is thoroughly washed with water to remove the pore forming sodium sulfate, bleached and dyed as required. The sponge mass firmly adheres to the cloth.

Example 2.—The sponge forming mass is produced by mixing 1330 grams of unripened viscose with 4000 grams of $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$ of various lump size, 200 grams of anhydrous sodium sulfate and 39 grams of hemp. A wooden handle is thickly coated with the compact mass formed

and the article is then placed into a boiling sodium sulfate solution. After boiling for several hours according to the size of the pieces coagulation is complete. The superfluous salt is then removed by washing.

In a publication in "Kolloid-Zeitschrift", vol. 57, pages 253 to 258 (page 257 being specifically referred to) Emil Hubert discussed the possibility of defining the properties of artificial sponges from viscose by their capability of swelling when immersed into water and their capability of retaining water taken up during said immersion, after being allowed to drip for half a minute.

Since the sponge coatings of this application are obtained in the same manner as those which Emil Hubert discussed, it is possible to define the properties of the sponge coatings in the manner suggested in the said publication. Thus the sponge coatings of our articles may have a capacity of swelling by 35 to 75 per cent of their original volume when immersed into water, the wet coating being capable of retaining from 80 to 90 per cent of the water taken up during the immersion, after being allowed to drip for 30 seconds.

It is obvious that my invention is not limited to the examples given, but I wish to include all such modifications which fall within the scope of the appended claims.

What I claim is:

1. A sponge article comprising a cellulosic support having a relatively thick directly and firmly adhering coating of a sponge mass comprising cellulose hydrate obtainable by coagulating a mass comprising viscose and a meltable or soluble pore-forming salt, and removing the pore-forming salt, said coating resembling natural sponge, the dry coating being capable of swelling by 35 to 75 per cent of its original volume when immersed into water, the wet coating being capable of retaining from 80 to 90 per cent of the water taken up during said immersion, after being allowed to drip for 30 seconds.

2. A sponge article comprising a paper support having a relatively thick directly and firmly adhering coating of a sponge mass comprising cellulose hydrate obtainable by coagulating a mass comprising viscose and a meltable or soluble pore-forming salt, and removing the pore forming salt, said coating resembling natural sponge, the dry coating being capable of swelling by 35 to 75 per cent of its volume when immersed into water, the wet coating being capable of retaining from 80 to 90 per cent of the water taken up during said immersion, after being allowed to drip for 30 seconds.

3. A sponge article comprising a cellulose containing web support having a relatively thick directly and firmly adhering coating of a sponge mass comprising cellulose hydrate obtainable by coagulating a mass comprising viscose and a meltable or soluble pore-forming salt, and removing the pore-forming salt, said coating having a high suction power and a sufficient thickness to enable the article to serve as a polishing cloth and said coating resembling natural sponge, the dry coating being capable of swelling by 35 to 75 per cent of its volume when immersed into water, the wet coating being capable of retaining from 80 to 90 per cent of the water taken up during said immersion, after being allowed to drip for 30 seconds.

4. A sponge article comprising a wood support having a relatively thick directly and firmly adhering coating of a sponge mass comprising cellulose hydrate obtainable by coagulating a mass comprising viscose and a meltable or soluble pore-forming salt, and removing the pore-forming salt, said coating resembling natural sponge, the dry coating being capable of swelling by 35 to 75 per cent of its volume when immersed into water, the wet coating being capable of retaining from 80 to 90 per cent of the water taken up during said immersion, after being allowed to drip for 30 seconds.

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